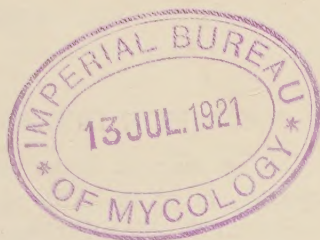


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COMMON DISEASES OF BEANS AND PEAS X 2nd ed.

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COMMON DISEASES OF BEANS AND PEAS¹

The growing of beans and peas is a very important industry, especially at points in the southern part of the state which are accessible to the Philadelphia markets. The loss due to fungous diseases is very heavy and is the cause of many inquiries to the Agricultural Experiment Station. Therefore, it is deemed advisable to prepare this circular on the common diseases of beans and peas and their treatments.

ANTHRACNOSE (*Colletotrichum lindemuthianum*) is the most common, the most destructive and the cause of the most inquiries. This is a fungous disease which is always prevalent on certain varieties of the wax, string or bush beans. It varies in severity with the character of the seed and with the weather. If the seed carries a large percentage of diseased beans, the attack will become severe earlier in the season than if the seed is comparatively clean. The disease is always more severe during a wet than during a dry season.

The disease attacks pods, leaves and stems. The pod form (fig. 1) is the cause of the most inquiries and many growers fail to recognize the fact that the disease as it appears on the leaves and stems is the same as that on the pods. It starts on the pods as small dark spots which increases in size, sometimes coalescing, thus forming large, irregular, canker-like spots which are pinkish, reddish or orange in color but become black with reddish borders. On the leaves it appears as black spots along the petiole and veins, usually on the lower surface. The older spots are somewhat sunken and more nearly like those on the pods. On the stems (fig. 2) it appears as spots very similar to those on the leaves but usually elongated up and down the axis.

¹Prepared June 9, 1917, by Mel. T. Cook, Ph.D., Plant Pathologist. A portion of this circular is a revision of Circular 50, New Jersey Agricultural Experiment Stations.

The disease is carried on the seed (fig. 3) and can be detected by the dark brown or reddish spots. Therefore, it is evident that the use of clean seed is of great advantage in controlling this disease. It is claimed that seed grown in the dry, irrigated districts of the West carry less of this disease than seed grown in other places. The writer is inclined to believe that this is correct. However, it is not always possible to secure this grade of seed and the writer knows from personal observation that much of the seed put on the New Jersey market contains a high percentage of diseased beans.

If the grower cannot secure satisfactory seeds, free from spots, he will find it advantageous to hand-pick the seed carefully, throwing out all beans that show suspicious spots, and also all wrinkled and cracked beans. This practice will give a better stand and a better crop.

Do not cultivate, hoe, or pick the beans when wet. The spores by which the fungus is spread are sticky when wet. They cling to the farm implements and to the hands and garments of the worker and are thus carried from place to place.

The disease spreads from pod to pod after the beans are picked. Therefore, it is advisable to handle the newly-picked beans as little as possible and to market them as soon as possible.

Root Rots may be due to several causes. The *Rhizoctonia* rot is most common and is the cause of many complaints. This organism attacks a large variety of plants but the symptoms are somewhat different for different groups of plants. In the case of beans and peas it causes cankers on the roots and in severe cases destroys practically the entire root system. We have very frequently found it associated with anthracnose.

The *sclerotinial* rot is sometimes very destructive. It is due to a soil fungus (*Sclerotinia libertiana*) which attacks the plants at about the surface of the soil, causing them to wilt and die. It also attacks stems and pods and sometimes spreads from pod to pod after picking. This organism is the cause of the lettuce drop, and also attacks a large number of other plants.

Another fungous disease (*Thielavia basicola*) is occasionally found on field peas and alfalfa and frequently on sweet peas. It, also, causes a rotting of the roots and a wilting and dying of the plants. It attacks several other varieties of plants.

Fusarium sp. has been found as the cause of a severe root rot in many localities in the state.

Beans which are planted early while the soil is cold and wet very frequently rot. Peas will survive a much lower temperature than beans.

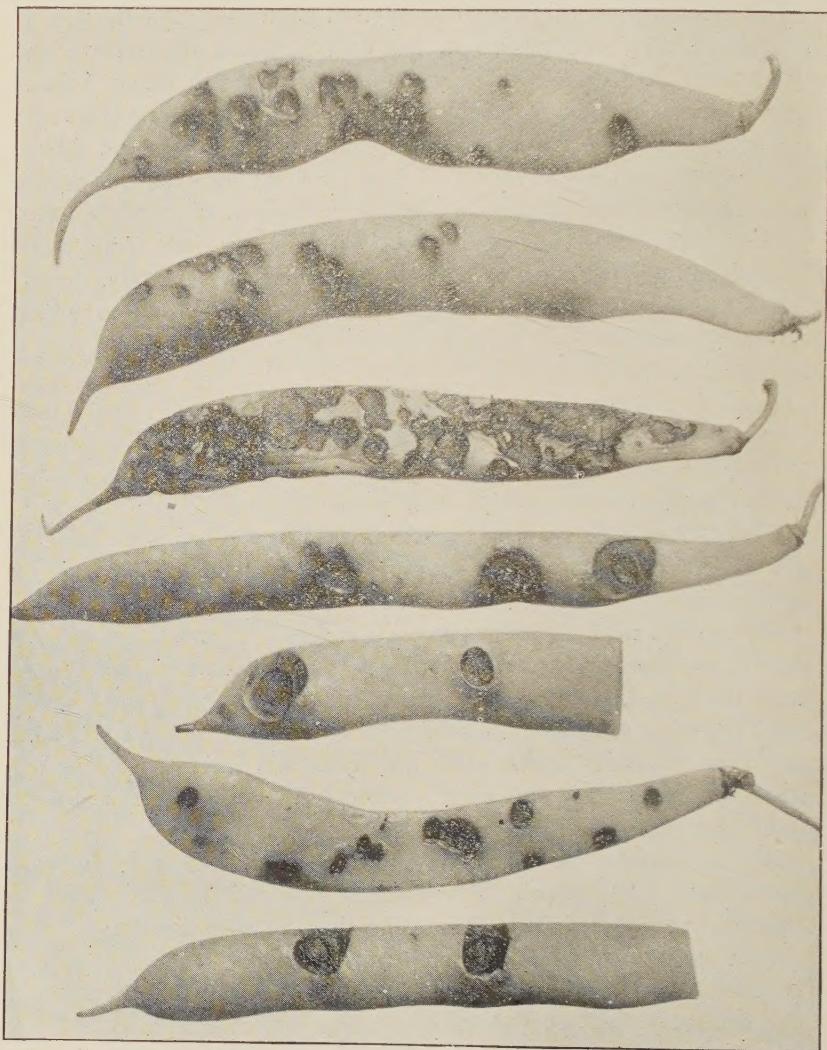


Fig. 1.—Anthracnose on bean pods. (Photo by R. F. Poole.)

The fact that these organisms attack such a large variety of plants makes it very difficult to devise methods of control. Burning the rubbish after harvest, deep plowing, and the rotation of crops, using corn or other grain crops, is advantageous.



Fig. 2.—Anthracnose on bean stems. (Photo by R. F. Poole.)

DAMPING-OFF is the name applied to the wilting and dying of many seedling plants. It may be due to any one of many fungi and

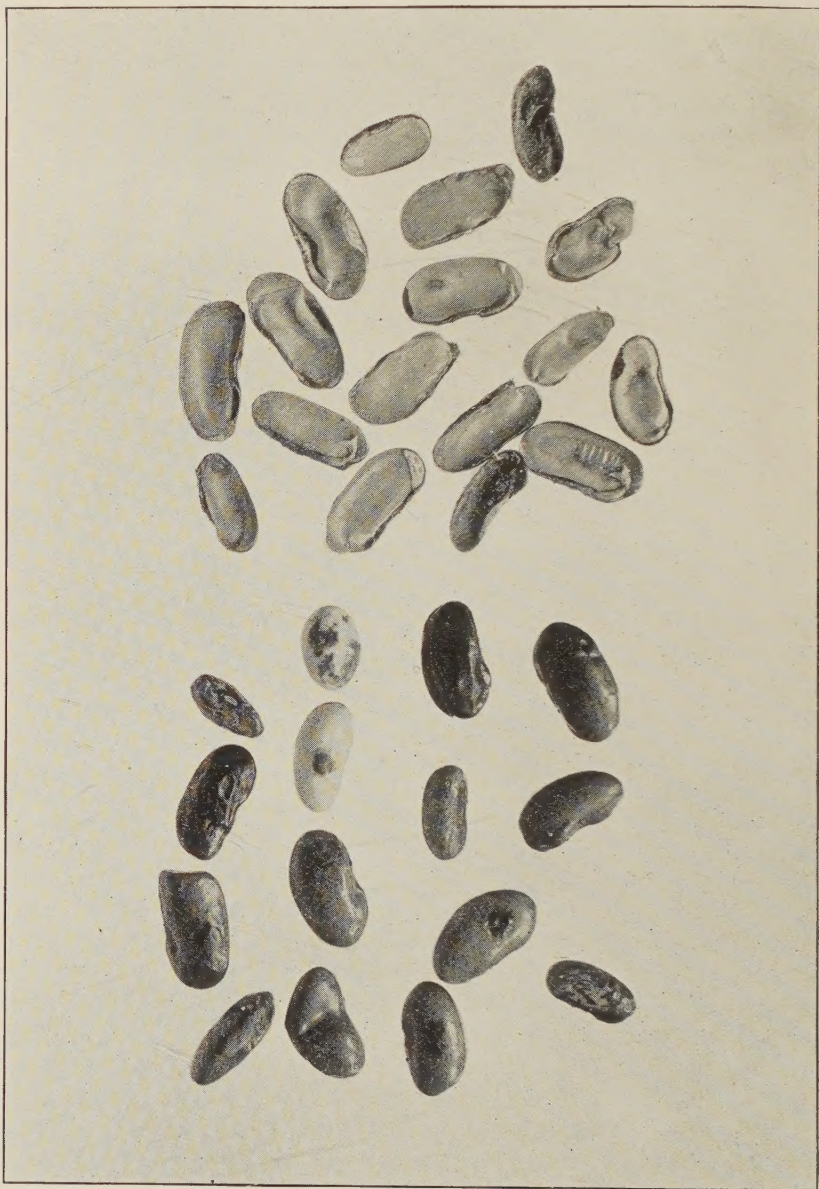


Fig. 3.—Anthracnose on bean seeds. (Photo by R. F. Poole.)

is the cause of many complaints early in the season. The fungi causing this disease live in rich soils, especially those that have been

highly manured. Under warm wet conditions they attack the seedling plants at the surface of the soil causing them to wilt, fall over and die.

LIMA BEAN POD BLIGHT (*Phoma subcircinata*) (fig. 4) is a very common fungous disease which is the cause of heavy losses in the southern part of the state, and the occasion of many inquiries. It appears on the pods as brown or black spots of various sizes. Mild forms of this disease reduce the market value and severe cases prevent the maturity of many pods.

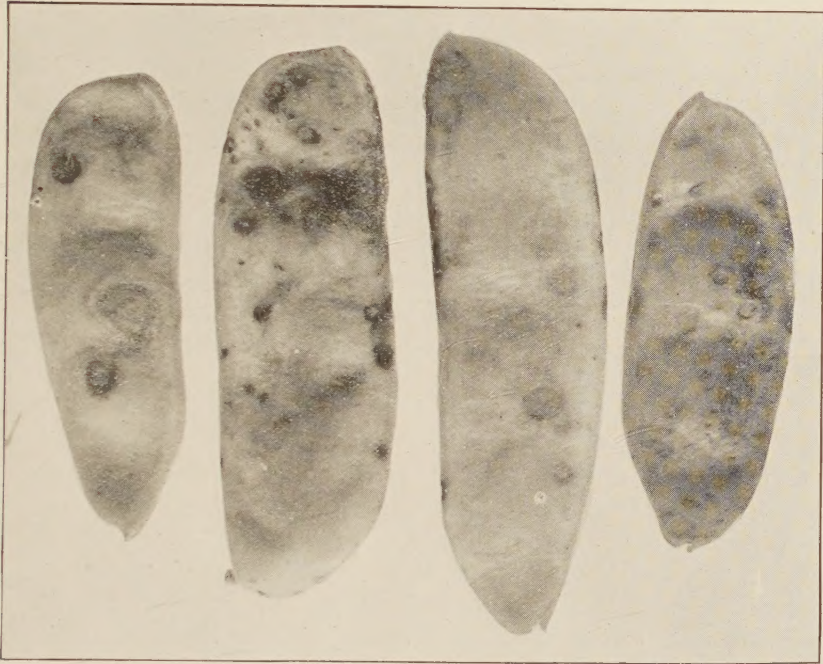


Fig. 4.—Lima bean pod blight. (Photo by R. F. Poole.)

LIMA BEAN LEAF SPOT (*Phyllosticta* sp.) is due to a fungous very similar to, or possibly the same as that causing the pod blight. It appears as brownish or black spots of irregular size.

These last two diseases are more or less prevalent every year, but sometimes become very severe. They are most severe immediately following wind storms, especially after the vines begin to bear. They are more serious on pole than on bush limas.

Dr. B. D. Halstead, botanist of the New Jersey Agricultural Experiment Station, reported in 1901 that the former could be controlled by spraying with Bordeaux mixture. The nature of these diseases is such that we would naturally expect them to be controlled by this treatment.

DOWNY MILDEW OF LIMA BEANS (*Phytophthora phaseoli*) has been found a number of times on specimens sent to this Station. It appears on the pods, buds, very young leaves and young shoots as a dense white down. It is especially severe in wet weather and causes heavy losses.

On small plantings it can be controlled by frequent sprayings with Bordeaux mixture.

RUST (*Uromyces appendiculatus*) is occasionally reported on lima beans. It appears on the leaves, especially the under surface, and also on the stems, as small brown circular spots which become black late in the season. This disease has thus far been of very little importance in New Jersey.

It can be controlled by spraying with Bordeaux mixture.

BLIGHT (*Bacterium phaseoli*) attacks both field and garden varieties and also the lima bean. On the leaves it appears as irregular, water-soaked spots with distinct yellow or red borders. These spots increase in size but finally become dry and brittle. On the pods it appears as slightly raised water-soaked pustules which become irregular in size and shape, amber-colored, and finally dry and shrivelled. On the stems it causes spots somewhat resembling the spots caused by anthracnose on the stems.

There is no satisfactory control, except the use of seed from healthy plants.

Other minor diseases of the bean are the bean leaf spot (*Isariopsis griseola*), the bean leaf blotch (*Cercospora cruenta*) and the powdery mildew (*Erysiphe polygoni*).

LEAF AND POD SPOT (*Ascochyta pisi*). This is a fungous disease of the pea which is quite common and the cause of greater losses than are realized by most growers. The earlier the attack, the greater is the loss. As a rule it does not destroy the plant but decreases the yield in accordance with the prevalence of the disease. Seeds from diseased plants do not germinate well, and the seedlings frequently show damping-off. The only satisfactory treatments are crop rotation, seed selection and the use of resistant varieties.

OTHER DISEASES. There are many other minor diseases of beans and peas which may become important under favorable circumstances. There are also many important diseases of cowpeas, soybeans, clovers, vetch and alfalfa which demand special study. Sweet peas, also, are affected by a number of diseases which cannot be considered at this time.

NOTE—For methods of making and using Bordeaux mixture see Circular 48, New Jersey Agricultural Experiment Station.